PART E
STORAGE OF EXPLOSIVE MATERIALS

WAC 296-52-69005 Detonators. Detonators must not be stored in magazines where other explosives are stored.

WAC 296-52-69010 Explosives. All Division 1.1, 1.2, 1.3, and 1.4 explosives, special industrial explosives, and any newly developed unclassified explosives, must be kept in magazines that meet the requirements of RCW 70.74.120 and this chapter, unless the explosives are:

- In the manufacturing process
- Being physically handled
- Being used at the blast site
  OR
- Being transported to a place of storage or use.

WAC 296-52-69015 Exempt explosives. Explosives exempt from these storage requirements are:

Type of Explosive	Exempted Amount
Stocks of: • Small arms ammunition, • Propellant-actuated power cartridges, and • Small arms ammunition primers	Quantities less than 750,000
Smokeless powder	Quantities less than 150 pounds
Black powder (as used in muzzleloading firearms)	Quantities less than 5 pounds
Explosive-actuated power devices	Quantities less than 50 pounds net weight of explosives
Fuse lighters and igniters	(not applicable)
Safety fuses (except cordeau detonant fuses)	(not applicable)

WAC 296-52-69020 Storage facilities. Explosives, except as specified in WAC 296-52-69015, and detonators in quantities of more than one thousand must be stored in permanent Type 1 magazines or approved and licensed magazines.

Note 1: Components storage.

Any two components which when mixed and become capable of detonation by a #8 detonator must be stored in a licensed approved magazine. Each component of two component explosives when unmixed must be stored in separate locked containers..

Note 2: Electro magnetic radiation precautions.

Blasting operations or storage of electrical detonators are prohibited in the area of operation radio frequency (RF) transmitter stations except where the clearances (WAC 296-52-67060, Extraneous electricity and radio frequency (RF) transmitters) can be observed.

Note 3: Detonators, electric detonators, detonating primers, and primed cartridges.

Detonators, electric detonators, detonating primers, and primed cartridges cannot be stored together or in the same magazine with other explosives.

WAC 296-52-69020 (Cont.)

Note 4: Ammonium perchlorate rocket motors.

Ammonium perchlorate rocket motors in 62.5 grams amounts or greater, but not to exceed 50 pounds in total weight of explosives, may be stored in an attached garage of a single-family residence if the living area is separated by a fire wall with one-hour minimum fire resistance .

WAC 296-52-69025 Quantity and distance tables. All explosive manufacturing buildings and magazines that store explosives or blasting agents (except small arms ammunition and smokeless powder), must meet the requirements as specified in:

- Table H-20, Distances for Storage of Explosives
- Table H-21, Distance Table for Separation between Magazines
- Table H-22, Separation Distance of Ammonium Nitrate and Blasting Agent from Explosives or Blasting Agents.

WAC 296-52-69030 Storage within magazines.

(1) **Storage materials.** Magazines cannot be used for storage of metal tools or any commodity other than:

- Explosives
- Blasting agents
- Blasting supplies

(2) **Black powder.**

- Black powder must be stored separately from other explosives in a magazine
- Kegs must be stored on end, bungs down, on sides, seams down

(3) **Age/or date mark.** Explosives that are not already age/or date marked by the manufacturer, must be marked with the manufacturing date before being stored in the magazine.

Note: Unidentified explosives confiscated by law enforcement may be marked with the confiscation date, if the manufacturer's date is unknown.

(4) **Grades and brands.**

- Identical grades and brands of explosives must be stored together, with the brands and grade marks showing
- Explosive materials must be stored so they can be easily checked and counted

(5) **Package placement.** Explosive packages must be:

- Placed right side up
- Stacked so they are stable

(6) **Ventilation.** Explosive material cannot be:

- Stored where they could interfere with ventilation

OR

- Placed less than two inches from the interior walls

Note: Nonsparking lattice or other nonsparking material may be used to prevent contact of stored explosive material with interior walls.

WAC 296-52-69030 (Cont.)

(7) **Housekeeping.**

- Magazine floors must be:
  - Regularly swept and the sweepings properly disposed of
  - Kept clean and dry
  - Free of grit, paper, and used packages or rubbish
- Brooms and other cleaning tools cannot have any spark producing metal parts
- Floors stained with nitroglycerin must be cleaned according to the manufacturer's instructions

(8) **Unpacking or repacking explosives.**

- Containers of explosives (except for fiberboard or other nonmetal containers) cannot be unpacked or repacked:
  - In a magazine
  - Within fifty feet of a magazine
  OR
  - Near other explosives
- Opened packages of explosives must be securely closed before returning them to a magazine
- Tools used for opening packages of explosives must be constructed of nonsparking materials
- A wood wedge and a fiber, rubber, or wood mallet must be used for opening or closing wooden crates of explosives.

WAC 296-52-69035 Storage limits. More than 300,000 pounds of explosive materials or 20,000,000 of detonators cannot be stored in the same storage magazine.

WAC 296-52-69040 Notification of fire safety authority. Any person who stores explosive material must notify the local fire safety authority, who has jurisdiction over the area where the explosive material is stored.

(1) The local fire safety authority must be notified:

- Orally, on the first day explosive materials are stored
- In writing, within forty-eight hours, from the time the explosive material was stored

(2) The notification must include the following for each site where explosive material is stored:

- Type of explosives
- Magazine capacity
- Location.

WAC 296-52-69045 Magazine repairs. Before beginning repair activities that could cause sparks or fire:

- All explosives must be removed from the magazine under repair and placed in another magazine or a safe distance away
- Explosives must be properly guarded until they are returned to the magazine
- The floor must be cleaned before beginning repairs inside a magazine.

WAC 296-52-69050 Inventory.

(1) A qualified person must be:

- Responsible for the magazine at all times
- At least twenty-one years old
- Held responsible for the enforcement of all safety requirements

(2) Explosives must:

- Be accounted for at all times
- Be kept in a locked magazine when not in use
- Not be easily accessed by unauthorized persons

(3) Inventory and use records must be kept up to date for all explosives.

(4) Any person responsible for explosives who discovers a theft or loss of explosives must report the incident to local law enforcement within twenty-four hours.

(5) Law enforcement agencies must report a theft or loss of explosives to the department immediately.

(6) Other people who know of attempted or actual unauthorized magazine entry must report this information to local law enforcement.

WAC 296-52-69055 Inspection.

(1) **Weekly inspection.**

(a) The person or company responsible for the contents of the magazine must inspect the magazine at least every seven days to determine whether there has been an unauthorized:

- Attempted entry into the magazine
  OR
- Removal of explosives from the magazine

(b) The person doing the inspection must be familiar with the magazine and its contents.

Note: This inspection does not need to be an inventory.

(2) **Inspection documentation.**

(a) The person doing the inspection must sign one of the following documents after completing the inspection:

- A weekly inspection log
- An inventory sheet
  OR
- Other record

(b) Weekly inspection records must be kept for at least one year.

WAC 296-52-69060 Precautions for areas surrounding magazine.

(1) **Firearms.** Only qualified guards and qualified law enforcement officers are allowed to carry firearms inside or within fifty feet of a magazine.

(2) **Area maintenance.** The area surrounding magazines must:

- Be kept clear of rubbish, brush, dry grass, or trees, except live trees more than ten feet tall, for a minimum of twenty-five feet in all directions
- Be free of volatile materials for a minimum of fifty feet from outdoor magazine
- Have the ground around storage facilities slope away for drainage, living foliage does not need to be removed.

(3) **Fire sources.** Smoking, matches, open flames, and spark producing devices are not permitted:

- In any magazine
- Within fifty feet of an outdoor magazine
  OR
- In any room containing an indoor magazine

(4) **Warning sign.**

(a) **Access routes.** All normal access routes to explosive material storage facilities, except Class 3 (1.4) magazines, must be posted with warning signs that read:

DANGER
NEVER FIGHT EXPLOSIVE FIRES
EXPLOSIVES ARE STORED ON THIS SITE
CALL

(b) **Sign specifications and placement.** Signs must:

(i) Be contrasting in color

(ii) Have the pin stroke of the letters a minimum of three inches (75 mm) high and one-half inch (12.5 mm) wide

(iii) Be placed so a bullet passing through the sign will not strike a magazine

(iv) Not be attached to magazines

(c) **Transportation placards.** Placards required by the U.S. Department of Transportation (DOT) (49 CFR) for transporting blasting agents must be displayed on all Class 5 magazines where blasting agents are stored.

WAC 296-52-69065 Deteriorated explosives.

- Explosives must be immediately destroyed, according to the manufacturer's recommendations, whenever they are suspected of deteriorating to the point they are:

WAC 296-52-69065 (Cont.)

- Unstable
- Dangerous
- Leaking nitroglycerine

- Only a licensed blaster may destroy explosives.

WAC 296-52-69070 Explosives recovered from misfires.

- **Storage.** Explosives recovered from misfires must be placed in a separate licensed magazine until they can be disposed of according to the manufacturer's recommendations
- **Detonator use.** Detonators suspected of being defective cannot be reused
- **Disposal.** The blaster in charge must dispose of explosives and detonators according to the manufacturer's recommendations.

WAC 296-52-69080 Blast site storage.

(1) **Location.** Temporary storage for explosives at blast sites must be located away from:

- Inhabited buildings
- Railways
- Highways
- Other magazines

(2) **Separation distance.** A distance must be maintained between magazines and the blast site. This distance must be a minimum of:

- One hundred fifty feet when the quantity of explosives is greater than twenty-five pounds
- Fifty feet when the quantity of explosives is twenty-five pounds or less.

WAC 296-52-69085 Multiple magazines.

(1) **Separation distance.** When two or more storage magazines are located on the same property, each magazine must comply with the minimum quantity of explosives and separation distance requirements for:

- Magazines (Table H-21)
- Inhabited buildings, railways, and highways (Table H-20)

(2) **Distances that do not meet requirements.** If the separation distance between two or more magazines is less than the distance required (Table H-21), the magazines must:

- Be considered one magazine
  AND
- Comply with the minimum distance requirements for inhabited buildings, railways, and highways (Table H-20)

(3) **Distance of grouped magazines to other magazines.** Each magazine in a group must comply with minimum magazine distance requirements (Table H-21) in relation to other magazines not considered part of the group.

WAC 296-52-69085 (Cont.)

(4) **Quantity of explosives.**

(a) **Magazine group.** The total quantity of explosives stored in a magazine group (two or more) must:

- Be considered one magazine
- Not exceed the requirements of Table H-21 for one magazine

(b) **Detonator magazine.** The quantity of explosives contained in a detonator magazine takes precedence over the minimum magazine distance requirements (Table H-21) when determining the separation distance required between a detonator magazine and magazines that contain other types of explosives.

(c) **Detonator strength.** Strengths of blasting and electric detonators:

- Up to #8 detonators must be rated as one and one-half pounds of explosives per one thousand detonators
- Detonators greater than #8 must be computed on the combined weight of explosives.

WAC 296-52-69090 Blasting agents and supplies.

(1) **Storage.**

Note: You may store blasting agents with nonexplosive blasting supplies.

(a) When stored with explosives, blasting agents or ammonium nitrate must be stored as required in magazine construction.

(b) When computing the total quantity of explosives, the mass of blasting agents and one-half the mass of ammonium nitrate must be included when determining the distance requirements.

(c) When stored separately from explosives, blasting agents and ammonium nitrate must be stored as required in this chapter

OR

Warehouses which are:

- One story without basements
- Noncombustible or fire resistant
- Constructed so there are no open floor drains and piping where molten materials could flow and be trapped in case of fire
- Weather resistant
- Well ventilated
- Equipped with a strong door which is securely locked except when open for business

(d) Semi-trailer or full trailer vans used for highway or on-site transportation of blasting agents. They must:

WAC 296-52-69090 (Cont.)

- Comply with location requirements for inhabited buildings, passenger railways, and public highways in Table H-20
- Be in accordance with the distance requirements in Table H-22
- Have substantial means for locking and the trailer doors must be kept locked except during the time of placement or removal of blasting agents

(e) Storage warehouses for blasting agents:

- Must comply with the location requirements for inhabited buildings, passenger railways, and public highways in Table H-20
- Must be in accordance with the distance requirements in Table H-22

(f) Combustible materials, flammable liquids, corrosive acids, chlorates, or nitrates cannot be stored in warehouses used for blasting agents unless they are separated by a fire resistant wall with a minimum of one-hour fire resistance.

(g) A competent person, at least twenty-one years old, must supervise every warehouse used for the storage of blasting agents.

(2) **Combustible materials.** These activities and items are prohibited within fifty feet (15.2 m) of any warehouse used for storing blasting agents:

- Smoking
- Matches
- Open flames
- Spark producing devices

(3) **Housekeeping.** The interiors of warehouses used for storing blasting agents must be:

- Kept clean, and free from debris and empty containers
- All spilled materials must be promptly cleaned.

WAC 296-52-69095 Ammonium nitrate.

(1) **Storage.**

(a) Ammonium nitrate storage requirements do not apply to:

- The transportation of ammonium nitrates while under the jurisdiction of and in compliance with U.S. DOT regulations (see 49 CFR, Part 173)
- The storage of ammonium nitrates while under the jurisdiction of and in compliance with U.S. Coast Guard (see 49 CFR, Parts 146-149)
- The storage of ammonium nitrate and ammonium nitrate mixtures, which are more sensitive than allowed by the bulletin

  "Definition and test procedures for ammonium nitrate fertilizers" from the Fertilizer Institute 501 2nd St. NE, Washington, DC 20006.

  This definition limits the contents of organic materials, metals, sulfur, etc., in products that may be classified ammonium nitrate fertilizer.

- The production of ammonium nitrate or the storage of ammonium nitrate on the premises of the producing plant, if no hazards are created to the employees or public

WAC 296-52-69095 (Cont.)

- The standards for ammonium nitrate (nitrous oxide grade) that are found in the:

  "Specifications, properties and recommendations for packaging, transportation, storage and use of ammonium nitrate," from the Compressed Gas Association, Inc., 1235 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4100.

(b) Ammonium nitrate storage requirements apply to:

- Anyone, in addition to the owner or lessee of any building, premises, or structure having or storing ammonium nitrate in quantities of one thousand pounds (425 kg) or more
- Ammonium nitrate in the form of crystals, flakes, grains, or prills including fertilizer grade, dynamite grade, nitrous oxide grade, technical grade, and other mixtures containing sixty percent or more ammonium nitrate by weight

Note: The approval of large quantity storage is based on the fire and explosion hazards, including exposure to toxic vapors from burning or decomposing ammonium nitrate.

(c) Storage buildings housing ammonium nitrate must:

- Have adequate ventilation or be self-ventilating in the event of a fire
- Have fire resistant walls when the exposed side of a storage building is within fifty feet (15.2 m) of a combustible building, forest, piles of combustible materials, and similar exposure hazards. Other suitable means of exposure protection such as a freestanding wall may be used instead of a fire resistant wall
- Have roof coverings that are Division 1.4 or better as defined in Roof Coverings, NFPA 203M-1970
- Have flooring of noncombustible material or be protected against saturation by ammonium nitrate. In case of fire, the floor must not have open drains, traps, tunnels, pits, or pockets into which molten ammonium nitrate could flow and be confined
- Be dry and free from water seepage through the roof, walls, and floors
- Not have basements, unless the basements are open on at least one side
- Not be over one story in height

Note: The continued use of an existing storage building or structure may be approved in cases where continued use will not constitute a hazard to life or adjoining property.

Bags, drums, and other containers of ammonium nitrate must:

(d) Comply with specifications and standards required for use in interstate commerce (see 49 CFR, Chapter 1). Containers used on the premises in the actual manufacturing or processing do not need to comply.

- Not be used for storage when the temperature of the ammonium nitrate exceeds 130°F (54.4°C)
- Not be stored within thirty inches (76 cm) of the storage building walls and partitions
- Not be stacked higher than twenty feet (6.1 m) in height, twenty feet (6.1 m) in width, and fifty feet (15.2 m) in length. When buildings are constructed of noncombustible materials or protected by automatic sprinklers, there are no stacking height restrictions
- Never be stacked closer than thirty-six inches (.09 m) below the roof or overhead supporting and spreader beams
- Be separated by aisles a minimum of 3 feet wide. There must be one main aisle in the storage area a minimum of four feet (1.2 m) wide

WAC 296-52-69095 (Cont.)

(e) Bulk ammonium nitrate must be stored:

- In warehouses with adequate ventilation or be capable of adequate ventilation in case of fire
- In structures that are not more than forty feet (12.2 m) high, unless:
  - They are constructed of noncombustible material
    OR
  - Have adequate facilities for fighting a roof fire
- In clean bins that are free of materials that could cause contamination
- In bins or piles that are clearly identified by signs reading "AMMONIUM NITRATE" in letters a minimum of two inches (5 cm) high
- In bins or piles sized and arranged so all material is moved periodically to minimize the possibility of caking
- Adequately separated from easily combustible fuels. Bins cannot be made of galvanized iron, copper, lead, and zinc because of the:
  - Corrosive and reactive properties of ammonium nitrate
    AND
  - To avoid contamination
- In tightly constructed wooden and aluminum bins that are protected against saturation from ammonium nitrate
- In tightly constructed partitions that divide the ammonium nitrate from other products to avoid contamination
- Where the temperature of the product does not exceed 130°F (54.4°C)
- No higher than thirty-six inches (0.9 m) below the roof or overhead supporting and spreader beams if stacked in piles. Stack items (height and depth), should be determined by the pressure setting tendency of the product

(f) Bulk ammonium nitrate when caked, cannot be broken up or loosed by the use of dynamite, other explosives or blasting agents.

(g) Bulk ammonium nitrate cannot be stored with:

- LP Gas on the premises except when such storage complies with WAC 296-24-475, Storage and handling of liquefied petroleum gases
- Sulfur and finely divided metals in the same building except when such storage complies with this chapter and NFPA standard 495, Explosives Materials Code
- Explosives and blasting agents in the same building except on the premises of manufacturers, distributors, and user of explosives or blasting agents
- When explosives or blasting agents are stored in separate buildings, other than on the approval of manufacturers, distributors, and user, they must be separated from the ammonium nitrate by the distances and/or barricades specified in Table H-22 or a minimum of fifty feet (15.2 m)
- With flammable liquids, such as gasoline, kerosene, solvents, and light fuel oils on the premises except when such storage conforms to WAC 296-24-330, Flammable and combustible liquids, and when walls, sills or curbs are provided in accordance with WAC 296-52-69095, Ammonium nitrate

WAC 296-52-69095 (Cont.)

(2) Contaminants must be stored in a separate building from ammonium nitrate

OR

Be separated by an approved firewall of not less that one-hour fire resistance rating which should extend to the underside of the roof. Alternatively, the contaminants may be separated by a minimum of thirty feet (9.1 m), instead of using walls. These contaminants are:

- Organic chemicals
- Acids
- Other corrosive materials
- Materials that may require blasting during processing or handling
- Compressed flammable gases
- Flammable and combustible materials
- Other substances including:

Animal fats	Baled cotton	Baled rags	Baled scrap paper
Bleaching powder	Burlap or cotton bags	Caustic soda	Coal
Coke	Charcoal	Cork	Camphor
Excelsior	Fibers of any kind	Fish oil	Fish meal
Foam rubber	Hay	Lubricating oil	Linseed oil
Other oxidizable or drying oils	Naphthalene	Oakum	Oiled clothing
Oiled paper	Oiled textiles	Paint	Straw
Sawdust	Wood shavings	Vegetable oil	

(3) Housekeeping requirements must have:

- Electrical installations, which meet the requirements of chapter 296-24 WAC, Part L, Electrical, and WAC 296-800-280, Basic electrical rules, for ordinary locations and be designed to minimize damage from corrosion
- Adequate lightning protections in areas where lightning storms are prevalent (see NFPA 78-1992, Lightning Protection Code)
- Procedures to prevent unauthorized personnel from entering the ammonium nitrate storage area

(4) Fire protection must provide:

- Water supplies and fire hydrants
- Suitable fire control devices, such as a small hose or portable fire extinguishers, throughout the warehouse and in the loading/unloading areas. These devices must comply with the requirements of WAC 296-800-300, Portable fire extinguishers, and WAC 296-24-602, Standpipe and hose systems
- Approved sprinkler systems installed according to WAC 296-24-607, Automatic sprinkler systems
- Two thousand five hundred tons (two thousand two hundred seventy metric) or less of bagged ammonium nitrate may be stored in a structure that does not have an automatic sprinkler system.

QUANTITY AND DISTANCE TABLES

WAC 296-52-69105 Table H-20--Table of distances for storage of explosives.

Table H-20
Table of Distances for Storage of Explosives

Quantity of Explosive (In Pounds)		Distances (in Feet)					
		Inhabited Buildings		Public Highways with Traffic Volume 3,000 or Less Vehicles Per Day		Passenger Railways and Public Highways: With Traffic Volume of More Than 3,000 Vehicles Per Day	
Over	**Not Over**	**Barricaded**	**Unbarricaded**	**Barricaded**	**Unbarricaded**	**Barricaded**	**Unbarricaded**
0	5	70	140	30	60	51	102
5	10	90	180	35	70	64	128
10	20	110	220	45	90	81	162
20	30	125	250	50	100	93	186
30	40	140	280	55	110	103	206
40	50	150	300	60	120	110	220
50	75	170	340	70	140	127	254
75	100	190	380	75	150	139	278
100	125	200	400	80	160	150	300
125	150	215	430	85	170	159	318
150	200	235	470	95	190	175	350
200	250	255	510	105	210	189	378
250	300	270	540	110	220	201	402
300	400	295	599	120	240	221	442
400	500	320	640	130	260	238	476
500	600	340	680	135	270	253	506
600	700	355	710	145	290	266	532
700	800	375	750	150	300	278	556
800	900	390	780	155	310	289	578
900	1,000	400	800	160	320	300	600
1,000	1,200	425	850	165	330	318	636
1,200	1,400	450	900	170	340	336	672
1,400	1,600	470	940	175	350	351	702

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1,600	1,800	490	980	180	360	366	732
1,800	2,000	505	1,010	185	370	378	756
2,000	2,500	545	1,090	190	380	408	816
2,500	3,000	580	1,160	195	390	432	864
3,000	4,000	635	1,270	210	420	474	948
4,000	5,000	685	1,370	225	450	513	1,026
5,000	6,000	730	1,460	235	470	546	1,092
6,000	7,000	770	1,540	245	490	573	1,146
7,000	8,000	800	1,600	250	500	600	1,200
8,000	9,000	835	1,670	255	510	624	1,248
9,000	10,000	865	1,730	260	520	645	1,290
10,000	12,000	875	1,750	270	540	687	1,374
12,000	14,000	885	1,770	275	550	723	1,446
14,000	16,000	900	1,800	280	560	756	1,512
16,000	18,000	940	1,880	285	570	786	1,572
18,000	20,000	975	1,950	290	580	813	1,626
20,000	25,000	1,055	2,000	315	630	876	1,752
25,000	30,000	1,130	2,000	340	680	933	1,866
30,000	35,000	1,205	2,000	360	720	931	1,962
35,000	40,000	1,275	2,000	380	760	1,026	2,000
40,000	45,000	1,340	2,000	400	800	1,068	2,000
45,000	50,000	1,400	2,000	420	840	1,104	2,000
50,000	55,000	1,460	2,000	440	880	1,140	2,000
55,000	60,000	1,515	2,000	455	910	1,173	2,000
60,000	65,000	1,565	2,000	470	940	1,206	2,000
65,000	70,000	1,610	2,000	485	970	1,236	2,000
70,000	75,000	1,655	2,000	500	1,000	1,263	2,000
75,000	80,000	1,695	2,000	510	1,020	1,293	2,000

WAC 296-52-69105 (Cont.)

80,000	85,000	1,730	2,000	520	1,040	1,317	2,000
85,000	90,000	1,760	2,000	530	1,060	1,344	2,000
90,000	95,000	1,790	2,000	540	1,080	1,368	2,000
95,000	100,000	1,815	2,000	545	1,090	1,392	2,000
100,000	110,000	1,835	2,000	550	1,100	1,437	2,000
110,000	120,000	1,855	2,000	555	1,110	1,479	2,000
120,000	130,000	1,875	2,000	560	1,120	1,521	2,000
130,000	140,000	1,890	2,000	565	1,130	1,557	2,000
140,000	150,000	1,900	2,000	570	1,140	1,593	2,000
150,000	160,000	1,935	2,000	580	1,160	1,629	2,000
160,000	170,000	1,965	2,000	590	1,180	1,662	2,000
170,000	180,000	1,990	2,000	600	1,200	1,695	2,000
180,000	190,000	2,010	2,010	605	1,210	1,725	2,000
190,000	200,000	2,030	2,030	610	1,220	1,755	2,000
200,000	210,000	2,055	2,055	620	1,240	1,782	2,000
210,000	230,000	2,100	2,100	635	1,270	1,836	2,000
230,000	250,000	2,155	2,155	650	1,300	1,890	2,000
250,000	275,000	2,215	2,215	670	1,340	1,950	2,000
275,000	300,000	2,275	2,275	690	1,380	2,000	2,000

Note 1: Terms used in Table H-20 are found in WAC 296-52-60130, Definitions.
Note 2: Source of table data is BATF (6/90) 55.218.

WAC 296-52-69110 Table H-21--Quantity and distance table for separation between magazines.

Note: This table applies to the permanent storage of commercial explosives only. It does not apply to:

- *Explosives handling*
- *Explosives transportation*
- *Temporary storage of explosives*
- *Bombs, projectiles, or other heavily encased explosives*

Magazines containing detonators and electric detonators must be separated from:

(1) Other magazines with similar contents.

OR

(2) Magazines containing explosives.

Note: Definitions of barricade including artificial and natural barricade can be found in WAC 296-52-60130, Definitions.

Table H-21

QUANTITY AND DISTANCE TABLE FOR SEPARATION BETWEEN MAGAZINES CONTAINING EXPLOSIVES		Separation Distance in Feet Between Magazines	
Pounds Over	Pounds Not Over	Not Barricaded	Barricaded
2	5	12	6
5	10	16	8
10	20	20	10
20	30	22	11
30	40	24	12
40	50	28	14
50	75	30	15
75	100	32	16
100	125	36	18
125	150	38	19
150	200	42	21
200	250	46	23
250	300	48	24
300	400	54	27
400	500	58	29
500	600	62	31

WAC 296-52-69110 (Cont.)

600	700	64	32
700	800	66	33
800	900	70	35
900	1,000	72	36
1,000	1,200	78	39
1,200	1,400	82	41
1,400	1,600	86	43
1,600	1,800	88	44
1,800	2,000	90	45
2,000	2,500	98	49
2,500	3,000	104	52
3,000	4,000	116	58
4,000	5,000	122	61
5,000	6,000	130	65
6,000	7,000	136	68
7,000	8,000	144	72
8,000	9,000	150	75
9,000	10,000	156	78
10,000	12,000	164	82
12,000	14,000	174	87
14,000	16,000	180	90
16,000	18,000	188	94
18,000	20,000	196	98
20,000	25,000	210	105
25,000	30,000	224	112
30,000	35,000	238	119
35,000	40,000	248	124
40,000	45,000	258	129

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45,000	50,000	270	135
50,000	55,000	280	140
55,000	60,000	290	145
60,000	65,000	300	150
65,000	70,000	310	155
70,000	75,000	320	160
75,000	80,000	330	165
80,000	85,000	340	170
85,000	90,000	350	175
90,000	95,000	360	180
95,000	100,000	370	185
100,000	110,000	380	195
110,000	120,000	410	205
120,000	130,000	430	215
130,000	140,000	450	225
140,000	150,000	470	235
150,000	160,000	490	245
160,000	170,000	510	255
170,000	180,000	530	265
180,000	190,000	550	275
190,000	200,000	570	285
200,000	210,000	590	295
210,000	230,000	630	315
230,000	250,000	670	335
250,000	275,000	720	360
275,000	300,000	770	385

Note: With site-specific department approval, a stand of mature timber may qualify as a natural barricade. The timber must be dense enough so the area requiring protection cannot be seen from the magazine when the trees are bare of leaves.

WAC 296-52-69115 Table H-22--Separation distances of ammonium nitrate and blasting agents from explosives or blasting agents.

Table H-22
Table of separation distances of ammonium nitrate and blasting agents
FROM EXPLOSIVES OR BLASTING AGENTS[1]

Donor weight		Minimum separation distance of receptor when barricaded[2] (ft.)		Minimum thickness of artificial barricades[5] (in.)
Pounds over	Pounds not over	Ammonium nitrate[3]	Blasting agent[4]	
	100	3	11	12
100	300	4	14	12
300	600	5	18	12
600	1,000	6	22	12
1,000	1,600	7	25	12
1,600	2,000	8	29	12
2,000	3,000	9	32	15
3,000	4,000	10	36	15
4,000	6,000	11	40	15
6,000	8,000	12	43	20
8,000	10,000	13	47	20
10,000	12,000	14	50	20
12,000	16,000	15	54	25
16,000	20,000	16	58	25
20,000	25,000	18	65	25
25,000	30,000	19	68	30
30,000	35,000	20	72	30
35,000	40,000	21	76	30
40,000	45,000	22	79	35
45,000	50,000	23	83	35
50,000	55,000	24	86	35

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55,000	60,000	25	90	35
60,000	70,000	26	94	40
70,000	80,000	28	101	40
80,000	90,000	30	108	40
90,000	100,000	32	115	40
100,000	120,000	34	122	50
120,000	140,000	37	133	50
140,000	160,000	40	144	50
160,000	180,000	44	158	50
180,000	200,000	48	173	50
200,000	220,000	52	187	60
220,000	250,000	56	202	60
250,000	275,000	60	216	60
275,000	300,000	64	230	60

Note 1: These distances apply to the separation of storage. Table H-20 must be used in determining separation distances from inhabited buildings, passenger railways, and public highways.

Note 2: When the ammonium nitrate and/or blasting agent is not barricaded, the distances shown in the table must be multiplied by six. These distances allow for the possibility of high velocity metal fragments from mixers, hoppers, truck bodies, sheet metal structures, metal containers, and the like which may enclose the "donor." When ammonium nitrate is stored in a bullet resistant magazine it is recommended explosives or where the storage is protected by a bullet resistant wall, distances, and barricade thickness in excess of those prescribed in Table H-20 are not required.

Note 3: The distances in the table apply to ammonium nitrate that passes the insensitivity test prescribed in the definition of ammonium nitrate fertilizer promulgated by the Fertilizer Institute, and ammonium nitrate failing to pass a test must be stored at separation distances determined by competent persons. (Definition and Test Procedures for Ammonium Nitrate Fertilizer, the Fertilizer Institute, formerly the National Plant Food Institute, November 1964.)

Note 4: These distances apply to nitro-carbo-nitrates and blasting agents, which pass the insensitivity test prescribed in the U.S. DOT regulations.

Note 5: Acceptable barricades include either natural or artificial barricades as defined in WAC 296-52-60130, Definitions.

Note 6: When the ammonium nitrate must be counted in determining the distances to be maintained from inhabited buildings, passenger railways, and public highways, it may be counted at one-half its actual weight because its blast effect is lower.

Note 7: Guide to use of table of recommended separation distances of ammonium nitrate and blasting agents from explosives or blasting agents.

(a) Sketch the location of all potential donors and acceptor materials together with the maximum amount of material to be allowed in the area. (Potential donors are high explosives, blasting agents, and combination of masses of detonating materials. Potential acceptors are high explosives, blasting agents, and ammonium nitrate.)

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(b) Consider each donor mass in combination with each acceptor mass. If the masses are closer than table allowance, distances measured between nearest edges, the combination of masses becomes a new potential donor of weight equal to the total mass. When individual masses are considered as donors, distances to potential acceptors must be measured between edges. When combined masses within propagating distance of each other are considered as a donor, the appropriate distance to the edge of potential acceptors must be computed as a weighted distance from the combined masses:

(i) Calculation of weighted distance from combined masses:

Let M_2, M_3... Mn be donor masses to be combined.

M_1 is a potential acceptor mass.

D_{12} is distance from M_1 to M_2 (edge to edge).

D_{13} is distance from M_1 to M_3 (edge to edge), etc.

To find weighted distance $D_{1(2,3\ldots\ n)}$ from combined masses to M_1, add the products of the individual masses and distances and divide the total by the sum of the masses:

$$\underline{D_{1(2,3n)} .= M_2 \text{ x } D_{12} .+ M_3 x D_{13} .+ M_n \text{ x } D_{in}}$$

$$M_2 .+ M_3 .+ M_n$$

Propagation is possible if either an individual donor mass is less than the tabulated distance from an acceptor or a combined mass is less than the weighted distance from an acceptor.

(c) When determining the distances separating highways, railroads, and inhabited buildings from potential explosions (as prescribed in Table H-20), the sum of all masses which may propagate (i.e., lie at distances less than prescribed in the table) from either individual or combined donor masses are included. However, the ammonium nitrate must be included, only 50 percent of its weight must be used because of its reduced blast effects. In applying Table H-21, distances from highways, railroads, and inhabited buildings, distances are measured from the nearest edge of potentially explodable material.

(d) When all or part of a potential acceptor comprises explosives Class A as defined in U.S. DOT regulations, storage in bullet resistant magazines is required. Safe distances to stores in bullet resistant magazines may be obtained from the intermagazine distances described in Table H-21.

(e) Barricades cannot have line of sight openings between potential donors and acceptors, which permit blast or missiles to move directly between masses.

(f) Good housekeeping practices must be maintained around any bin containing ammonium nitrate or blasting agent. This includes keeping weeds and other combustible materials cleared within twenty-five feet of the bin. Accumulation of spilled product on the ground must be prevented.

WAC 296-52-69120 Table H-23--Quantity and distance tables for manufacturing buildings.

Explosives manufacturing plants that have buildings and magazines, where workers are regularly employed, must meet the quantity and separation distance requirements of Table H-23, intraexplosives plant quantity and distance table **.**

(1) **Explosives manufacturing buildings.** Explosives manufacturing buildings must be located away from manufacturing and nonmanufacturing buildings as required by Table H-23.

(2) **Magazines.** Magazines must be located away from manufacturing and nonmanufacturing buildings as required by Table H-23.

TABLE H-23

Explosives		**Distance Feet**
Pounds Over	**Pounds Not Over**	
		Separate Building or Within Substantial Dividing Walls
. . . .	10	
10	25	40
25	50	60
50	100	80
100	200	100
200	300	120
300	400	130
400	500	140
500	750	160
750	1,000	180
1,000	1,500	210
1,500	2,000	230
2,000	3,000	260
3,000	4,000	280
4,000	5,000	300
5,000	6,000	320
6,000	7,000	340
7,000	8,000	360

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8,000	9,000	380
9,000	10,000	400
10,000	12,500	420
12,500	15,000	450
15,000	17,500	470
17,500	20,000	490
20,000	25,000	530
25,000	30,000	560
30,000	35,000	590
35,000	40,000	620
40,000	45,000	640
45,000	50,000	660
50,000	55,000	680
55,000	60,000	700
60,000	65,000	720
65,000	70,000	740
70,000	75,000	770
75,000	80,000	780
80,000	85,000	790
85,000	90,000	800
90,000	95,000	820
95,000	100,000	830
100,000	125,000	900
125,000	150,000	950
150,000	175,000	1,000
175,000	200,000	1,050
200,000	225,000	1,100
225,000	250,000	1,150
250,000	275,000	1,200
275,000	300,000	1,250

WAC 296-52-69125 Table H-24--Low explosives.

(1) Use Table H-24 for: Magazines that are restricted to:

- Division 1.2 or 1.3
- Division 1.4, low explosives
- Low explosives classified by BATF

(2) Detonators cannot be stored with low explosives.

Table H-24
TABLE OF DISTANCES FOR STORAGE OF LOW EXPLOSIVES

Pounds		From inhabited building distance (feet)	From public railroad and highway distance (feet)	From above ground magazine (feet)
Over	Not Over			
0	1,000	75	75	50
1,000	5,000	115	115	75
5,000	10,000	150	150	100
10,000	20,000	190	190	125
20,000	30,000	215	215	145
30,000	40,000	235	235	155
40,000	50,000	250	250	165
50,000	60,000	260	260	175
60,000	70,000	270	270	185
70,000	80,000	280	280	190
80,000	90,000	295	295	195
90,000	100,000	300	300	200
100,000	200,000	375	375	250
200,000	300,000	450	450	300

WAC 296-52-69130 Table of distances for the storage of display fireworks (except bulk salutes).

Net weight of fireworks (pounds)	Distance between magazine and inhabited building, passenger railway, or public highway (feet)	Distance between magazine (feet)
0-1,000	150	1--
1,001-5,000	230	150
5,001-10,000	300	200
Above 10,000	Use Table H-20	--

Note 1: The net weight is the weight of all pyrotechnic compositions, and explosive materials and fuse only.
Note 2: For the purposes of applying this table, the term magazine also includes fireworks shipping buildings for display fireworks.
Note 3: For fireworks storage magazines in use prior to (2000) the distances in this table may be halved if properly barricaded between the magazine and potential receptor sites.
Note 4: This table does not apply to the storage of bulk salutes. Use Table H-20 for storage of bulk salutes.